

IN THE CLAIMS:

1. (currently amended): An apparatus for controlling the power at the output of an internal combustion engine coupled to a continuously variable transmission in a vehicle, comprising:

(a) an electric motor coupled to the output of said engine; and

(b) a system controller configured to operate said motor simultaneously with said engine and apply motor torque to said engine output to maintain engine power or torque output substantially along a predetermined operating line;

(c) said system controller further configured to control rate of change of ratio of said continuously variable transmission;

(d) wherein said system controller varies acceleration and deceleration of a vehicle of said vehicle by varying motor torque and rate of change of ratio of said continuously variable transmission.

2. (original) An apparatus as recited in claim 1, wherein said motor comprises a motor/generator.

3. (canceled)

4. (previously presented): An apparatus as recited in claim 2, wherein said system controller is configured to apply positive or negative motor/generator torque to said engine output.

5. (previously presented): An apparatus as recited in claim 1, wherein said system controller is configured to apply positive motor torque to said engine output.

6. (canceled)

7. (canceled)

8. (canceled)

9. (currently amended): An apparatus for controlling the power at the output of an internal combustion engine coupled to a continuously variable transmission in a vehicle, wherein the rate of change of ratio of said transmission is controllable, comprising:

(a) an electric motor positioned between said engine and said transmission; and

(b) a system controller configured to vary the rate of change of the ratio of said transmission and to operate said motor simultaneously with said engine and apply ~~positive or negative~~ motor torque to said engine output to maintain engine power or torque output substantially along a predetermined operating line;

(c) wherein said system controller varies acceleration and deceleration of a vehicle of said vehicle by varying motor torque and rate of change of ratio of said continuously variable transmission.

10. (previously presented): An apparatus as recited in claim 9, wherein said system controller is configured to apply positive motor torque to said engine output.

11. (previously presented): An apparatus as recited in claim 9, wherein said motor comprises a motor/generator, and wherein said system controller is configured to apply positive or negative motor/generator torque to said engine output.

12. (currently amended): An apparatus for controlling the power at the output of an internal combustion engine coupled to a continuously variable transmission in a vehicle, comprising:

(a) a generator coupled to the output of said engine; and

(b) a system controller configured to operate said generator simultaneously with said engine and apply generator torque to said engine output to maintain engine power or torque output substantially along a predetermined operating line;

(c) said system controller further configured to control rate of change of ratio of said continuously variable transmission;

(d) wherein said system controller varies acceleration and deceleration of a vehicle of said vehicle by varying generator torque and rate of change of ratio of said continuously variable transmission.

13. (original): An apparatus as recited in claim 12, wherein said generator comprises a generator/motor.

14. (previously presented): An apparatus as recited in claim 13, wherein said system controller is configured to apply positive or negative generator/motor torque to said engine output.

15. (previously presented): An apparatus as recited in claim 12 wherein said system controller is configured to apply negative generator torque to said engine output.

16. (currently amended): An apparatus as recited in claim 12, further comprising:

(a) an electric motor;
(b) said system controller configured to vary torque output of said motor;
(c) wherein said generator, said generator system controller, and said motor and said motor controller function as an electric continuously variable transmission.

17. (original): An apparatus as recited in claim 16, wherein said motor comprises a motor/generator.

18. (canceled)

19. (currently amended): A control apparatus for an internal combustion engine driving a continuously variable transmission and a driveshaft coupled to said

continuously variable transmission in a vehicle, wherein the rate of change of ratio of said continuously variable transmission is controllable, comprising:

- (a) a generator/motor mechanically coupled to and driven by said engine;
- (b) a generator/motor controller electrically connected to said generator/motor;
- (c) a motor/generator mechanically coupled to said drive shaft;
- (d) a motor/generator controller electrically connected to said motor/generator;
- (e) a battery electrically connected to said generator/motor controller and said motor/generator controller;
- (f) said generator/motor, said generator/motor controller, said motor/generator, said motor/generator controller, and said battery comprising said continuously variable transmission; and
- (g) a system controller configured to vary the rate of change of the ratio of said continuously variable transmission and to operate said generator/motor simultaneously with said engine and apply generator/motor torque to said engine output to maintain engine power or torque output substantially along a predetermined operating line;
- (h) wherein said system controller varies acceleration and deceleration of a vehicle of said vehicle by varying generator/motor torque and rate of change of ratio of said continuously variable transmission.

20. (previously presented): A control apparatus for a vehicle having an internal combustion engine driving a continuously variable transmission, wherein said continuously variable transmission has an output driving a first wheel at a first end of said vehicle wheel, and wherein the rate of change of ratio of said continuously variable transmission is controllable, comprising:

- (a) an electric motor driving a second wheel at a second end of said vehicle;
- (c) said motor coupled to said transmission through a road surface; and
- (d) control means for varying the rate of change of the ratio of said continuously variable transmission and for operating said motor simultaneously with

said engine to apply motor torque to said engine output to maintain engine power or torque output substantially along a predetermined operating line;

(e) wherein said control means varies acceleration and deceleration of said vehicle by varying motor torque and rate of change of ratio of said continuously variable transmission.

21. (previously presented): A control apparatus for a vehicle having an internal combustion engine, an electric motor/generator coupled to said engine and driving a continuously variable transmission, and a battery system powering the electric motor, comprising:

a system controller configured to operate said motor/generator simultaneously with said engine and apply positive or negative motor/generator torque to said engine output to maintain engine power or torque output substantially along a predetermined operating line;

wherein said predetermined operating line comprises an ideal operating line as determined by empirical testing of the engine, electric motor/generator, and battery system;

said system controller further configured to control rate of change of ratio of said continuously variable transmission;

wherein said system controller varies acceleration and deceleration of said vehicle by varying motor/generator torque and rate of change of ratio of said continuously variable transmission.

22. (previously presented): A control apparatus for a vehicle having an internal combustion engine and an electric motor/generator, wherein said internal combustion engine and said electric motor/generator are coupled to a continuously variable transmission, and wherein the rate of change of ratio of said continuously variable transmission is controllable, comprising:

(a) an engine controller mechanically connected to said internal combustion engine;

- (b) a motor/generator controller electrically connected to said electric motor/generator; and
- (c) control means for controlling said engine controller and said motor/generator controller, for varying rate of change of the ratio of said transmission, and for operating said motor/generator simultaneously with said engine to apply positive or negative ~~motor~~ motor/generator torque to said engine output to maintain engine power or torque output substantially along a predetermined operating line;
- (d) wherein said system controller varies acceleration and deceleration of said vehicle by varying motor/generator torque and rate of change of ratio of said continuously variable transmission.

23. (currently amended): An apparatus for controlling the power at the output of an internal combustion engine coupled to a continuously variable transmission in a vehicle, comprising:

- (a) an electric motor/generator coupled to the output of said engine; and
- (b) control means for operating said motor/generator simultaneously with said engine and applying positive or negative motor/generator torque to said engine output to maintain engine power or torque output substantially along a predetermined operating line and for controlling rate of change of ratio of said continuously variable transmission;
- (c) wherein said control means varies acceleration and deceleration of a vehicle of said vehicle by varying motor/generator torque and rate of change of ratio of said continuously variable transmission.

24. (previously presented): In a hybrid electric vehicle having the output of an internal combustion engine coupled to a continuously variable transmission, the improvement comprising:

- (a) an electric motor/generator coupled to the output of said engine; and
- (b) control means for operating said motor/generator simultaneously with said engine and applying positive or negative motor/generator torque to said engine output to maintain engine power or torque output substantially along a predetermined

operating line and for controlling rate of change of ratio of said continuously variable transmission;

(c) wherein said control means varies acceleration and deceleration of said vehicle by varying motor/generator torque and rate of change of ratio of said continuously variable transmission.

REMARKS

This Amendment is being submitted in response to the Examiner's Amendment which was entered in response to a telephone interview with the undersigned on July 15, 2003, and which accompanied the Notice of Allowability.

While matching the amendments made by the Examiner to the currently pending claims, the Applicant has identified an error in the Examiner's Amendment with regard to Claim 23 (See P. 2, Item 1E) of Examiner's Amendment). The Applicant believes that the correct reference should be to line 11 rather than to line 12. Therefore, to ensure that the patent is printed correctly, the Applicant has amended Claim 23 as shown herein.

In addition, the Applicant has reviewed the amendments in general, which were made for the purpose of addressing lack of antecedent basis for the phrase "of said vehicle" in the body of the claims. The amendment made by the Examiner, and previously agreed upon, was to change "of said vehicle" to "of a vehicle".

In retrospect, the Applicant believes that the claim language would have a better flow if the preambles were changed to refer to a vehicle so that the phrase "of said vehicle" could be used in the body of the claim. Accordingly, the Applicant respectfully submits the amendments herein for entry into this application.

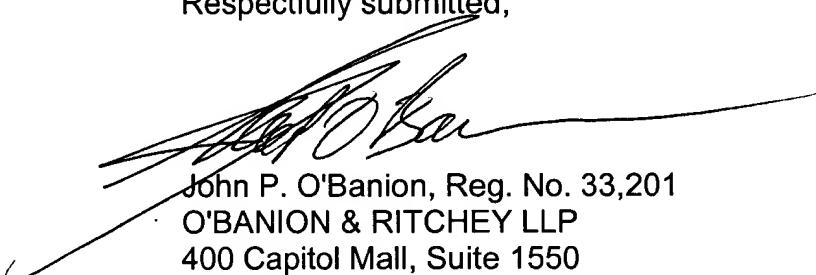
In addition, the Applicant noted that certain terms in Claim 16 lacked proper antecedent basis as a result of a prior amendment of Claim 12. Accordingly, Claim 16 has been amended to delete the references to a "generator controller" and a "motor controller" and, instead, to refer to a "system controller" consistent with the language in Claim 12.

No new matter has been added, and none of these amendments affects the substance or scope of the claims. Entry is respectfully requested.

Lastly, the Applicant noted that the Notice of Allowability did not require new drawing sheets containing the changes to FIG. 4, FIG. 5 and FIG. 6 approved by the Examiner. Therefore, replacement sheets are being submitted herewith. The Applicant is submitting herewith a complete set of replacement drawings so that the drawing sheets conform to 37 CFR 1.84.

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Respectfully submitted,


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